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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,539	02/24/2005	Frank Joseph Pompei	HOLOS-004BX	7088
207 7590 09/19/2008 WEINGARTEN, SCHURGIN, GAGNEBIN & LEBOVICI LLP TEN POST OFFICE SQUARE BOSTON, MA 02109				
EXAMINER KURR, JASON RICHARD				
ART UNIT 2615		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/525,539

**Applicant(s)**

POMPEI, FRANK JOSEPH

**Examiner**

JASON R. KURR

**Art Unit**

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date 2/24/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

Claims 3, 20 and 23 are objected to because of the following informalities:

Claim 3 contains the misspelled word "on", the word should be spelled "one".

Claim 20 contains the misspelled word "approximatie".

Claims 20 and 23 contain the misspelled word "misalignment".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-6 and 15-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Spencer et al (US 7,224,808 B2).

With respect to claim 1, Spencer discloses, In a system using the nonlinearity of a propagation medium to demodulate ultrasonic waves having audio modulated onto the ultrasonic frequency, audio signal processing circuitry (fig.4) comprising: a delay means (fig.4 "Delay Line") for the audio signal providing a delayed audio signal (col.14 ln.53-

59); envelope generator means (fig.4 "Instantaneous Envelope Detector") providing an envelope signal which is a function of peaks of the audio signal over a predetermined interval (col.14 ln.35-38); combiner means (fig.4 "Unlabeled Summers") for the delayed audio signal and the envelope signal, the resulting combined signal being useful in processing for modulation of said ultrasonic frequency.

With respect to clam 3, Spencer discloses the audio processing circuitry of claim 1 wherein at least on of said delay means and envelope generator means comprise digital circuitry (col.2 ln.59-64).

With respect to clam 4, Spencer discloses the audio processing circuitry of claim 3 wherein both said delay means and envelope generator means are digital and means are provided for providing digital sampling of said audio signal; said delay means delays said audio signal N samples; and said envelope generator means examines M prior samples of digitized audio signal (col.2 ln.59-64).

With respect to clam 5, Spencer discloses the audio processing circuitry of claim 4 wherein N and M are set at values to align the digitized audio signal to corresponding times in the envelope signal (col.2 ln.59-64).

With respect to clam 6, Spencer discloses the audio processing circuitry of claim 1 further including a low pass filter (fig.4 "Lowpass Filter") for the envelope signal and having a settling time or group delay where the delay interval corresponds to a settling time or group delay of the Low pass filter.

With respect to clam 15, Spencer discloses the system of claim 1 further including means for ultrasonically modulating the combined signal (fig.4).

With respect to claim 16, Spencer discloses the system of claim 15 further including means for projecting ultrasonic sound wave representations of the modulated combined signal (col.7 ln.29-34).

With respect to claim 17, Spencer discloses the system of claim 16 wherein said projecting means includes amplifier means and transducer means (col.7 ln.29-34).

With respect to claim 18, Spencer discloses the system of claim 17 further including means for providing an offset bias in the modulated signal (col.14 ln.62-64).

With respect to claim 19, Spencer discloses the system of claim 18 wherein said bias maintains the modulated signal in a predetermined polarity (col.14 ln.62-64).

With respect to claim 20, Spencer discloses, In a system using the nonlinearity of a propagation medium to demodulate ultrasonic waves having audio modulated onto the ultrasonic frequency, audio signal processing circuitry (fig.4) comprising: envelope generator means (fig.4 "Instantaneous Envelope Detector") providing an envelope signal which is an approximate function of peaks of the audio signal over a predetermined interval (col.14 ln.35-38), said approximate function having misalignment of envelope and audio signal; means for converting (fig.4 "Delay Line") the audio signal and the envelope signal into an ultrasonic signal characterized by a carrier signal and reduced misalignment.

With respect to claim 21, Spencer discloses the system of claim 20 wherein said converting means includes means for delaying the audio signal (fig.4 "Delay Line").

With respect to claim 22, Spencer discloses the system of claim 20 wherein said converting means includes means for adjusting the level of said carrier signal to reduce said misalignment (col.14 ln.62-64).

With respect to claim 23, Spencer discloses, In a system using the nonlinearity of a propagation medium to demodulate ultrasonic waves having audio modulated onto the ultrasonic frequency, audio signal a processing method comprising: generating an envelope (fig.4 "Instantaneous Envelope Detector") which is an approximate function of peaks of the audio signal over a predetermined interval, said approximation having misalignment of envelope and audio signal; converting the audio signal and the envelope signal into an ultrasonic signal characterized by a carrier signal and reduced misalignment (col.1 ln.60-67, col.2 ln.1-27).

With respect to claim 24, Spencer discloses the method of claim 23 wherein said converting step includes the step of delaying the audio signal (fig.4 "Delay Line").

With respect to claim 25, Spencer discloses the method of claim 23 wherein said converting step includes the step of adjusting the level of said carrier signal to reduce said misalignment (col.14 ln.62-64).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spencer et al (US 7,224,808 B2) in view of Croft, III et al (US 6,584,205 B1).

With respect to claim 2, Spencer discloses the audio signal processing circuitry of claim 1, however does not disclose expressly wherein the means comprise analog circuitry.

Croft discloses audio signal processing circuitry in a system using nonlinearity of propagation to demodulate ultrasonic waves, wherein the circuitry may be either analog or digital (col.5 ln.1-2). At the time of the invention it would have been obvious to a person of ordinary skill in the art to use analog circuitry to realize the signal processing of Spencer as taught by Croft. The motivation for doing so would have been reduce production costs.

With respect to claim 7, Spencer discloses the system of claim 1, however does not disclose expressly further including premodulation processing means responsive to the combined signal for modifying the combined signal to allow the medium demodulation to provide a demodulated acoustic signal which is a substantially accurate representation of an original audio signal applied to said audio processing circuitry.

Croft discloses audio signal processing circuitry in a system using nonlinearity of propagation to demodulate ultrasonic waves including premodulation processing means (fig.13 #66) responsive to a combined signal for modifying the combined signal to allow the medium demodulation to provide a demodulated acoustic signal which is a substantially accurate representation of an original audio signal applied to said audio

processing circuitry (col.10 ln.22-41). At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the premodulation processing means of Croft in the invention of Spencer. The motivation for doing so would have been to reduce error in the form of artifacts in the reproduced ultrasonic signal.

With respect to claim 8, Spencer discloses the system of claim 7 wherein said premodulation processing means generates an approximate square root function on the combined signal (Croft: fig.9A #34).

With respect to claim 9, Spencer discloses the system of claim 7 wherein said premodulation means processes said combined signal by a polynomial expansion of a predetermined number of terms (Croft: fig.9A #34).

With respect to claim 10, Spencer discloses the system of claim 7 wherein said premodulation means processes said combined signal by use of a precalculated lookup table (Spencer: col.15 ln.1-30).

With respect to claim 11, Spencer discloses the system of claim 7 wherein said premodulation means includes upsampling and low pass filter means (Spencer: fig.4 "Lowpass Filter") to provide an enhanced bandwidth prior to premodulation processing (Spencer: col.2 ln.59-64).

With respect to claim 12, Spencer discloses the system of claim 1 further including up sampling and low pass filter means prior to any modulation (Spencer: fig.4 "Lowpass Filter").



With respect to claim 13, Spencer discloses the system of claim 7 wherein said premodulation processing provides polarity reversal of the combined signal (Croft: col.5 ln.59-65).

With respect to claim 14, Spencer discloses the system of claim 13 wherein said polarity reversal is a function of one or more of the criteria that the combined signal as applied to the premodulation means is: close to a zero value; has a relatively high slope; short-time power spectrum estimate indicates a wide bandwidth; and slope is near a zero value while a rate of change of the slope is positive (Croft: col.5 ln.59-67).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Norris (US 5,889,870) discloses an acoustic heterodyne device and method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON R. KURR whose telephone number is (571)272-0552. The examiner can normally be reached on M-F 10:00am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason R Kurr/  
Examiner, Art Unit 2615

/Vivian Chin/  
Supervisory Patent Examiner, Art Unit 2615